

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1, 6 and 19-20 have been amended to improve their form without narrowing their scope. No new matter is being added. Claims 1-20 are pending.

Claim objections

Claims 1 and 20 were objected to for informalities. Claims 1 and 20 have been amended as suggested in the Office Action, thus overcoming the objections thereto.

Allowable subject matter

Applicants appreciate the indication that claims 8-11, 13-15, 17 and 18 contain allowable subject matter.

Rejections under 35 U. S. C. §§ 102 and 103

Claims 1-4, 7, 19, and 20 stand rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 6,263,667 to Sawada et al. ("Sawada"). Claim 5 stands rejected under 35 U. S. C. § 103(a) as being unpatentable over Sawada in view of U.S. Patent No. 6,763,656 to Bidner et al ("Bidner"). Claim 6 stands rejected under 35 U. S. C. § 103(a) as being unpatentable over Sawada in view of U.S. Patent No. 6,477,832 to Surnilla et al. ("Surnilla"). Claim 12 stands rejected under 35 U. S. C. § 103(a) as being unpatentable over Sawada in view of Official Notice. Claim 16 stands rejected under 35 U. S. C. § 103(a) as being unpatentable over Sawada and Bidner in view of Official Notice. These rejections are respectfully traversed for the reasons given below.

Independent claim 1 recites "an abnormality determining section that executes an abnormality determination of the NO_x removing catalyst on the basis of output values of both of the first exhaust gas atmosphere detecting section and the second exhaust gas atmosphere detecting section from a time at which the output value of the first exhaust gas atmosphere detecting section is varied to a first predetermined value to a time at which the output value of

the second exhaust gas atmosphere detecting section reaches a second predetermined value when the exhaust gas atmosphere varying section increases the ratio between the reducing agent and the oxidizing agent in the exhaust gas.” Thus, in claim 1, when the exhaust gas atmosphere varying section increases the ratio between the reducing agent and the oxidizing agent in the exhaust gas, i.e., during rich spike control, the abnormality determining section executes an abnormality determination of the NO_x removing catalyst on the basis of output values of both of the first exhaust gas atmosphere detecting section and the second exhaust gas atmosphere detecting section in a time interval from: (1) a time at which the output value of the first exhaust gas atmosphere detecting section is varied to a first predetermined value, to (2) a time at which the output value of the second exhaust gas atmosphere detecting section reaches a second predetermined value. The references applied in the rejections of the claims do not suggest executing abnormality determination during rich spike control of a NO_x catalyst on the basis of output values of both of a first exhaust gas atmosphere detecting section (upstream) and a second exhaust gas atmosphere detecting section (downstream) in the time interval, as recited in claim 1.

Sawada merely discloses that while an oxidization reaction of a NO_x catalyst is carried out, determining the oxidization and reduction capacity of the catalyst 7 when the exhaust gas at the downstream side of the catalyst 7 changes to a lean air-fuel ratio on the basis of a stoichiometric air-fuel ratio holding time (TSTR) when the exhaust air-fuel ratio on the downstream side of the catalyst 7 changes to lean. Sawada, however, does not disclose, as in claim 1, executing an abnormality determination during rich spike control of a NO_x catalyst on the basis of output values of both of a first exhaust gas atmosphere detecting section (upstream) and a second exhaust gas atmosphere detecting section (downstream) in a time interval from: (1) a time at which the output value of the first exhaust gas atmosphere detecting section is varied to a first predetermined value to (2) a time at which the output value of the second exhaust gas atmosphere detecting section reaches a second predetermined value.

Bidner and Surnilla were cited for disclosing other features of the claims, but fail to cure the deficiencies of Sawada.

Moreover, the references applied in the rejection of claim 1 fail to realize the advantages attendant thereto. In claim 1, by executing the abnormality determination of the NOx removing catalyst during rich spike control on the basis of output values of both of the first exhaust gas atmosphere detecting section and the second exhaust gas atmosphere detecting section in the time interval recited, a stable and a highly accurate abnormality determination is possible with the elimination of the influence of control error and control variation of the air-fuel ratio during rich spike control. This advantage is not realized by the references applied in the rejection of the claims.

Independent claims 19 and 20, respectively recite “abnormality determining means for executing an abnormality determination of the NOx removing catalyst means on the basis of output values of both of the first exhaust gas atmosphere detecting means and the second exhaust gas atmosphere detecting means from a time at which the output value of the first exhaust gas atmosphere detecting means is varied to a first predetermined value to a time at which the output value of the second exhaust gas atmosphere detecting means reaches a second predetermined value when the exhaust gas atmosphere varying means increases the ratio between the reducing agent and the oxidizing agent in the exhaust gas” and “executing an abnormality determination of the NOx removing catalyst on the basis of output values of both of the first exhaust gas atmosphere detecting section and the second exhaust gas atmosphere detecting section from a time at which the output value of the first exhaust gas atmosphere detecting section is varied to a first predetermined value to a time at which the output value of the second exhaust gas atmosphere detecting section reaches a second predetermined value when the exhaust gas atmosphere varying section increases the ratio between the reducing agent and the oxidizing agent in the exhaust gas”, and are thus patentable for reasons analogous to claim 1.

The dependent claims are patentable for at least the same reasons as their respective independent claims, as well as for further patentable features recited therein.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date

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By

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